

What is claimed is:

1. A system for delivery of a tissue supporting device to a bifurcated body lumen, the system comprising:

3 a catheter with an inflatable balloon, the inflatable balloon configured to
4 deliver an expandable tissue supporting device to the lumen;

5 a guide member received on a side of the balloon and connected to the
6 catheter; and

7 a branch lumen guidewire extending along an exterior of the balloon and
8 longitudinally slidable in the guide member.

1 2. The system of Claim 1, wherein the guide member extends radially from the
2 side of the balloon and is arranged to be received in a side hole of a tissue supporting
3 device mounted on the balloon.

1 3. The system of Claim 1, wherein the guide member includes a guide loop.

1 4. The system of Claim 1, further comprising a tissue supporting device
2 mounted on the balloon, and the branch lumen guidewire is slidable along an exterior of the
3 tissue supporting device.

1 5. The system of Claim 4, wherein the guide member is positioned between the
2 tissue supporting device and the balloon and is crimped in place by crimping of the tissue
3 supporting device onto the balloon.

1 6. The system of Claim 1, wherein the guide member includes a fastener
2 connected to the catheter.

1 7. The system of Claim 6, wherein the fastener includes a crimping lug which
2 is connected to a body of the guide member by a tether.

1 8. The system of Claim 1, wherein the guide member includes first and second
2 guide loops which are arranged to be received in side holes of a tissue supporting device
3 mounted on the balloon.

1 9. A guide member for use in delivery of a tissue supporting device to a
2 bifurcated body lumen in a desired longitudinal and radial position, the guide member
3 comprising:

4 a guide loop for receiving a guidewire;
5 means for securing the guide loop to a catheter; and
6 at least one tab extending from the guide loop for holding the guide loop in
7 position in a side hole of a tissue supporting device to be delivered.

1 10. The guide member of Claim 9, wherein the at least one tab is a curved
2 member having a radius of curvature which corresponds substantially to an inner radius of
3 the tissue supporting device to be delivered.

1 11. The guide member of Claim 9, wherein the guide loop and at least one tab
2 are formed from a single piece of tubing.

1 12. The guide member of Claim 9, wherein the means for securing the guide
2 loop to a catheter includes a crimping lug which is connected to the guide loop by a tether.

1 13. The guide member of Claim 9, further comprising a spacer member
2 connected to the guide loop and configured to space the guide loop a predetermined
3 distance from a distal edge of the side hole of the tissue supporting device when the guide
4 loop is positioned in the side hole of the tissue supporting device.

1 14. The guide member of Claim 9, further comprising an auxiliary guide loop
2 positioned proximally of the guide loop.

1 15. A method of delivering of a tissue supporting device to a bifurcated body
2 lumen comprising:

3 providing an expandable tissue supporting device in an unexpanded
4 configuration, the tissue supporting device having a side hole;
5 positioning a guide member in the side hole;
6 positioning a side branch guidewire in a body lumen with a distal end of the
7 side branch guidewire extending into a side branch of a bifurcation;
8 delivering the tissue supporting device into the body lumen by tracking the
9 guide member along the side branch guidewire;
10 positioning the tissue supporting device with the side hole aligned radially
11 and longitudinally with an opening of the side branch; and
12 expanding the tissue supporting device.

1 16. The method of Claim 15, wherein the tissue supporting device is delivered
2 and expanded by a balloon catheter.

1 17. The method of Claim 15, wherein the guide member is positioned in the side
2 hole such that a guide loop of the guide member extends out of the side hole of the tissue
3 supporting device.

1 18. The method of Claim 15, wherein the tissue supporting device is expanded
2 by expanding a distal segment of the tissue supporting device, removing the side branch
3 guidewire from the guide member, and then expanding a proximal segment of the tissue
4 supporting device.

1 19. The method of Claim 15, further comprising delivering a second tissue
2 supporting device to support the side branch of the bifurcation.

1 20. The method of Claim 19, wherein the second tissue supporting device
2 includes a side hole and is delivered by a method comprising:

3 positioning a second guide member in the side hole;

4 positioning a guidewire in the body lumen with a distal end of the guidewire
5 extending into the expanded tissue supporting device;

6 delivering the second tissue supporting device into the body lumen by
7 tracking the second guide member along the guidewire;

8 positioning the second tissue supporting device with the side hole aligned
9 radially and longitudinally with an opening of a main branch of the bifurcation; and
10 expanding the second tissue supporting device.

1 21. The method of Claim 15, wherein the delivery of the tissue supporting
2 device is visualized by fluoroscopy.

1 22. The method of Claim 17, wherein an auxiliary guide loop extends out of an
2 auxiliary side hole of the tissue supporting device.